CLAIMS:

1. A wiring board comprising a dielectric substrate, a signal transmission line formed on one surface of said dielectric substrate, a grounded layer formed on the other surface of said dielectric substrate, and a connection portion for connecting the signal transmission line to a waveguide, said connection portion being formed on the grounded layer; wherein,

said grounded layer has a slot at a position opposed to an end of said signal transmission line; and

said connection portion includes a first dielectric portion formed so as to cover the slot of said ground layer, a second dielectric portion laminated on said first dielectric portion, and a patched conductor provided at a position opposed to said slot on an interface between the first dielectric portion and the second dielectric portion.

2. A wiring board according to claim 1, wherein a first dielectric layer is formed so as to cover substantially the whole surface of the grounded layer formed on the other surface of said dielectric substrate, and a second dielectric layer is laminated on the first dielectric layer, and wherein said patched conductor is provided in an interface between said first dielectric layer and said second dielectric layer, a portion of said first dielectric layer positioned on said slot forms the first dielectric portion, and a portion of said second dielectric layer positioned on said slot forms the second dielectric portion.

3. A wiring board according to claim 2, wherein vertical conductors are provided penetrating through the first dielectric layer and the second dielectric layer so as to surround said patched conductor with said patched conductor as a center, said first dielectric portion and

said second dielectric portion are formed in the region surrounded by said vertical conductors, and the conductor wall of the waveguide to be connected to the connection portion is electrically connected to said grounded layer via said vertical conductors.

4. A wiring board according to claim 1, wherein a maximum length SL of said slot in a direction at right angles with the signal transmission line is from 1 to 2 times as great as the wave length of signals propagarting through the dielectric substrate.

5. A wiring board according to claim 4, wherein said patched conductor has a rectangular shape and, when a maximum length of said patched conductor is denoted by W1 in a direction at right angles with said signal transmission line, and a maximum length thereof is denoted by L1 in a direction in parallel with said signal transmission line, there holds a relationship $L1 \geqq W1$.

6. A wiring board according to claim 5, wherein, when the wave length of signals propagating through the dielectric substrate is denoted by λ, the length L1 satisfies the condition of the following formula,

$$10\lambda/64 \leqq L1 \leqq 31\lambda/64$$

or

$$33\lambda/64 \leqq L1 \leqq 63\lambda/64.$$

7. A wiring board according to claim 1, wherein resonance conductor portions that resonate with the signal transmission line are provided at portions positioned on the grounded layer near an end of the signal transmission line on said dielectric substrate.

8. A wiring board according to claim 7, wherein a shortest distance between said resonance conductor portions and the signal transmission line is not larger than 2 times the wave length of signals propagating through the dielectric substrate.

9. A wiring board according to claim 7, wherein said

resonance conductor portions have a length which is 1/8 to 7/8 the wave length of signals propagating through the dielectric substrate.

10. A wiring board according to claim 7, wherein, as viewed on a plane, said resonance conductor portions are provided in a number of at least two symmetrically with respect to said signal transmission line.

11. A wiring board according to claim 3, wherein a third dielectric layer is laminated on said second dielectric layer, said third dielectric layer has a cavity at a position corresponding to said second dielectric portion, and an electrically conducting layer is formed on the inner walls of said cavity, said electrically conducting layer being electrically connected to said vertical conductors.

12. A wiring board according to claim 11, wherein said third dielectric layer has a thickness of not smaller than 2.5% of the wave length of signals propagating through the dielectric substrate.

13. A wiring board according to claim 11, wherein an electrically conducting band is formed in an interface between said second dielectric layer and said third dielectric layer in order to electrically connect said vertical conductors to the electrically conducting layer on the inner walls of said cavity.

14. A wiring board according to claim 11, wherein on the surface of said third dielectric layer is formed an electrically conducting band in order to electrically connect a flange formed at an end of the waveguide, that is to be connected, to the electrically conducting layer on the inner walls of said cavity.

15. A wiring board according to claim 3, wherein the first dielectric portion and the second dielectric portion surrounded by said vertical conductors have an outer shape same as, or smaller than, the shape of the opening in

cross section of the waveguide that is to be connected.

16. A wiring board according to claim 2, wherein a connection member is provided on said second dielectric layer to secure the electrically conducting walls of the waveguide, said connection member has, formed therein, an opening of a size substantially the same as the shape of the opening portion in cross section of the waveguide that is to be connected, and the inner surfaces of the opening of said connection member are formed of an electric conductor.

17. A wiring board according claim 15, wherein a connection member is provided on said second dielectric layer to secure the electrically conducting walls of the waveguide, said connection member has, formed therein, an opening of a size larger than the outer shapes of said first and second dielectric portions but is substantially the same as the shape of the opening portion in cross section of the waveguide that is to be connected, and the inner surfaces of the opening of said connection member are formed of an electric conductor.

18. A wiring board according claim 11, wherein a connection member is provided on said third dielectric layer to secure the electrically conducting walls of the waveguide, said connection member has, formed therein, an opening of a size substantially the same as the shape of the opening portion in cross section of the waveguide that is to be connected and as the shape in cross section of the cavity in said third dielectric layer, and the inner surfaces of the opening of said connection member are formed of an electric conductor.